

IN THE CLAIMS

Claims 1-54 were previously cancelled. Claims 55 and 57 are currently amended.

Claims 56 and 58-103 are carried forward, all as follows.

Claims 1-54 (Cancelled)

55. (Currently Amended) A device for regulating at least one register in a printing press comprising:

at least one printing group;

at least one forme cylinder, one transfer cylinder and one counter-pressure cylinder in said at least one printing group and adapted to print a multiple color printed image on an imprinting substrate being printed in multiple colors ~~color~~ in said printing group and travelling in a substrate direction of travel;

an image sensor, said image sensor being adapted to record a multiple color printed ~~an image of a width of~~ said imprinting substrate transverse to said substrate direction of travel and to generate data correlated with said image;

an evaluating unit, said evaluating unit being adapted to receive said data of said multiple color printed image recorded during a running production of said printing press and to compare multiple parameters of said data with reference data of a previously recorded multiple color printed reference image, said evaluation unit being adapted to separate ~~separating~~ said multiple color printed image into color separations and to perform a relative position determination of said color separations with respect to color separations of said previously recorded multiple color printed reference image;

a forme cylinder drive mechanism adapted to be controlled separately from a drive mechanism for said counter-pressure cylinder assigned to said at least one forme cylinder;

an actuator for said forme cylinder drive mechanism, said evaluation unit being adapted to generate an actuating command to said forme cylinder drive mechanism actuator to regulate a register of said forme cylinder in response to said data comparison, said evaluating unit performing said-a relative position determination of said-a color separations of said width of said multiple color image as-separation provided by said image sensor-data comparison; and

a pre-printing stage located upstream, in said-a direction of travel of said substrate, said printing press, said data of said-previously recorded image recorded during said running production being correlated with said reference data of said previously recorded multiple color printed reference-an image recorded in said pre-printing stage, said reference image having proper registration of said multiple color image.

56. (Previously Presented) The device of claim 55 further including means for supplying ink to said at least one forme cylinder, said actuator generating said actuating command to an actuating drive mechanism for said means for supplying ink from said data comparison.

57. (Currently Amended) A device for controlling register and color density in a printing press comprising:

at least one printing group having at least one forme cylinder, one transfer cylinder and one counter-pressure cylinder, said printing group imprinting a multiple color printed image on an imprinting substrate being printed in said at least one printing group and traveling in a substrate direction of travel during a running production of said printing press color;

an image sensor, said image sensor being usable to record said multiple color printed-an image of a width of said imprinting substrate transverse to said substrate direction of travel and to generate data correlated with said image;

an evaluating unit usable to receive said image data of said multiple color printed image printed during said running production and to receive reference data of a previously generated multiple color printed image, said evaluation unit separating said running production multiple color printed image data and said previously generated multiple color printed reference previous image data into color separations, said evaluating unit further performing a relative positional determination of said color separations of said running production multiple color printed image data in relation to said color separations of said previously generated multiple color printed reference previous image data;

an ink supply to said at least one printing group and having an ink supply drive mechanism;

a register regulatory drive mechanism; and

means in said evaluating unit for correcting differences detected by said relative positional determination between said running production multiple color printed image data and said previously generated multiple color printed reference image data in one of a substrate transport direction and a direction transverse to said transport direction into actuating commands for said ink supply drive mechanism and for said register regulatory drive mechanism.

58. (Previously Presented) The device of claim 57 wherein said image sensor is directed onto said imprinting substrate.

59. (Previously Presented) The device of claim 57 wherein said image sensor covers said imprinting substrate transversely to said transport direction.

60. (Previously Presented) The device of claim 57 further including a forme cylinder drive mechanism adapted to be controlled separately from said counter-pressure cylinder.

61. (Previously Presented) The device of claim 55 wherein said evaluating unit performs said relative position determination by a correlation method.
62. (Previously Presented) The device of claim 55 wherein said evaluating unit performs said relative position determination by a cross-correlation method.
63. (Previously Presented) The device of claim 55 wherein said relative position determination is performed several times.
64. (Previously Presented) The device of claim 55 further including a dampening agent supply and means for regulating said dampening agent supply in response to said data comparison.
65. (Previously Presented) The device of claim 55 wherein said register of said forme cylinder is one of a circumferential register, a lateral register, and a diagonal shifting of said forme cylinder with respect to said transfer cylinder associated with said forme cylinder.
66. (Previously Presented) The device of claim 55 wherein said actuator regulates one of a phase position and an angular relation of said forme cylinder.
67. (Previously Presented) The device of claim 57 further including a data network connected to said evaluating unit, said drive mechanisms being correlated to said data network.
68. (Previously Presented) The device of claim 55 further including a company network and a connection between said evaluating unit and said company network.

69. (Previously Presented) The device of claim 55 further including an input and output unit adapted to provide correction options for said actuating command, said evaluating unit being in a bi-directional data exchange with said input and output unit.
70. (Previously Presented) The device of claim 69 further including a monitor in said input and output unit and adapted to display said recorded image.
71. (Previously Presented) The device of claim 55 further including a memory device in said evaluating unit and adapted to store sequences of said recorded image.
72. (Previously Presented) The device of claim 57 wherein said printing press applies at least one printed image to said imprinting substrate.
73. (Previously Presented) The device of claim 57 wherein said regulation takes place simultaneously with an inspection of said printed image.
74. (Previously Presented) The device of claim 55 further including several of said printing groups arranged in said printing press in said direction of transport of said imprinting substrate and wherein said image sensor is located in an outlet of a last one of said printing groups.
75. (Previously Presented) The device of claim 55 further including a delivery device for said printing press and wherein said image sensor is located at said delivery device.
76. (Previously Presented) The device of claim 55 wherein said evaluating unit checks at least one of a shading change and a registration maintenance during said running production of said printing press.

77. (Previously Presented) The device of claim 76 wherein said check is performed on each printed copy in said printing press.

78. (Previously Presented) The device of claim 55 wherein said evaluating unit classifies checked printed copies into groups of different quality.

79. (Previously Presented) The device of claim 55 wherein said evaluating unit is adapted to store data for use in determining quality of printed products.

80. (Previously Presented) The device of claim 57 further including at least one of an imprinting substrate transport device and an imprinting substrate marking device and means in said evaluating unit for issuing an actuating command to said at least one of said transport device and said marking device when said image data exceeds a permissible tolerance limit.

81. (Previously Presented) The device of claim 55 further including an angle encoder installed on said at least one printing group and adapted to synchronize a frequency of recording of said images with a transport speed of said imprinting substrate.

82. (Previously Presented) The device of claim 81 wherein said angle encoder is installed in said printing group having said image sensor.

83. (Previously Presented) The device of claim 81 wherein said angle encoder transmits an output signal to said evaluating unit.

84. (Previously Presented) The device of claim 57 further including means changing said ink supply using said evaluating unit in response to a shading change exceeding a permissible tolerance limit.

85. (Previously Presented) The device of claim 55 wherein said evaluating unit is adapted to change at least one register in said printing press to obtain registration accuracy.

86. (Previously Presented) The device of claim 57 wherein said data of said previously generated image is correlated with said image recorded by said image sensor.

87. (Previously Presented) The device of claim 57 further including a pre-printing device located upstream, in a direction of travel of said imprinting substrate, said data of a previously generated image being correlated with an image generated in said pre-printing stage.

88. (Previously Presented) The device of claim 87 further including a data processing device in said pre-printing stage and correlated with said evaluating unit, said data processing device transmitting data of previously generated images to said evaluating device.

89. (Previously Presented) The device of claim 55 further including several of said printing groups, each said forme cylinder of each said printing group being controlled independently of said forme cylinder of another of said several printing groups.

90. (Previously Presented) The device of claim 89 wherein said evaluating unit is adapted to set one of mutual angular relation and phase relation of said forme cylinder involved in printing said color image in said imprinting substrate.

91. (Previously Presented) The device of claim 55 wherein said forme cylinder drive mechanism is coaxial with a shaft of said forme cylinder.
92. (Previously Presented) The device of claim 55 wherein said drive mechanism for said forme cylinder is rigidly connected with a shaft of said forme cylinder.
93. (Previously Presented) The device of claim 55 further including several printing groups in said printing press and wherein said counter-pressure cylinders in said several printing groups are mechanically connected.
94. (Previously Presented) The device of claim 93 further wherein said counter-pressure cylinder in said several printing groups have a common drive mechanism.
95. (Previously Presented) The device of claim 93 further including a drive mechanism for said counter-pressure cylinders and being separate from a drive mechanism for said forme cylinders and said transfer cylinders of said several printing groups.
96. (Previously Presented) The device of claim 55 further wherein said forme cylinder drive mechanism drives said transfer cylinder associated with said forme cylinder.
97. (Previously Presented) The device of claim 55 wherein said evaluating unit performs an analysis of portions of said printed image using said data of a previously recorded image.
98. (Previously Presented) The device of claim 97 wherein said portions of said printed images are ones with substantially all color.

99. (Previously Presented) The device of claim 97 wherein said evaluating device determines portions of individual color components of said printed image.

100. (Previously Presented) The device of claim 55 wherein said evaluating unit converts positional differences detected by said relative position determination between color separation provided from said data into at least one actuating command.

101. (Previously Presented) The device of claim 55 wherein said evaluating unit evaluates suitable portions of a special color image different from standard colors of a colored image.

102. (Previously Presented) The device of claim 97 wherein said evaluating unit stores said printed images in a memory device.

103. (Previously Presented) The device of claim 102 wherein said printed images are stored in said memory device at a desired position.